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ABSTRACTS
from
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(Pages refer to the Japanese originals of this volume unless otherwise noted.)

Studies on the Lactic Acid Bacteria Isolated from Mashes of Various Kinds of Cereals.

(pp. 697～714)

By Kakuo KITAHARA.

(Department of Agriculture, Kyoto Imperial University; Received July 3, 1940.)

From various kinds of mashes, 42 strains of lactic acid formers were isolated at different temperatures of 30～52°. All the strains were found to be Gram-negative, non-motile, non-spore-bearing and produced lactic acid from glucose and fructose.

According to their morphological and physiological characteristics mentioned in the previous paper (This Journal **14** (1938), 1449), the classification of these bacteria was proposed as follows:

Group I.	*Streptococcus* (*Enterococcus*) (2 strains); *Sc. faecalis* (1), *Sc. glycerinaceus* (1)
Group II.	*Pediococcus* (6 strains); *Pc. hennebergi* (2), *Pc. lindneri* (4)
Group III.	*Leuconostoc* (2 strains); *Leuc. mesenteroides* α-type (1), *Leuc. mesenteroides* β-type (1)
Group IV.	*True-Lactobacillus* (Homo-fermenters, without catalase) (8 strains); *L. delbrückii* (2), *L. acidophilus* (1), *L. casei* (1), *L. plantarum* (1), *L. xylosus* nov. sp. (3)
Group V.	*Beta-Lactobacillus* (Hetero-fermenters, without catalase) (15 strains); *L. brevis* α-type (1), *L. fermentum* α-type (7), *L. betadelbrückii* nov. sp. (1), *L. brevis* β-type (3), *L. fermentum* β-type (3)
Group VI.	*Wild-Lactobacillus* (revealed catalase action) (11 strains); *L. thermophilus* (6), *L. ciliatus* nov. sp. (2), *L. caneus* nov. sp. (3).

The very characteristic natures of the newly recorded species *L. xylosus, L. betadelbrückii, L. ciliatus* and *L. caneus* were pointed out.

Comparing with the distribution of the strains of lactic acid bacteria between the dairy products and the mashes, it was concluded that *Streptococci* and *True-Lactobacilli* were abundant in dairy products. *Pediococci,* which were never isolated with dairy products, were found to be abundantly present in the mashes. The distributions of *Tetracocci* and of *Escherichia* were limited to the dairy products. *Beta-Lactobacilli* and *Wild-Lactobacilli* were more frequently isolated with the mashes, while *Leuconostoc* was distributed equally between the mashes and the dairy products.

Exchangeable Calcium and Magnesium of Soils in Tyōsen.

(pp. 715~724)

By MISU-Hideo.

(Agricultural Experiment Station, Government General of Tyōsen;
Received June 6, 1940.)

Über die Fabrikation des Alkohol aus Überrest des Maniokmehls. (Amyloverfahren)

(SS. 725~730)

Von Masao TAKESITA.

(The Institute of Research on Chemical Industry, Government-General of Taiwan, Japan;
Eingegangen am 24. 6. 1940.)

Studies of Fiber from *Cannabis sativa* (I)

Relation of Constituents of Fiber to the Growth Periods and Sex. On the Value of the Fiber from Wooden Parts of Hemp as Pulp.

(pp. 731~738)

By Yoshijirô KIHARA, Hikonojô NAKAHARA, and Gorô KODERA.

(Agri. Chem. Laboratory, Tokyo Imp. Univ.;
Received June 29, 1940.)

The wooden part of the hemp has with its growth a tendency to decrease in quantity of ash, alcohol-benzene extract and the total soluble sugar, while the crude protein and the total cellulose are increased, and lignin, pentosan and α-cellulose remain unchanged.

With respect to the sex of this plant, in staminate, alcohol-benzene extract, crude protein, total soluble sugar and pentosan can be found in higher proportion than in pistillate, but the total cellulose as well as α-cellulose in pistillate, appear in a larger percentage than in staminate. The analytical quantity of ash and lignin is the same in both sexes.

The constituents of the fiber, which is made from the wooden part of hemp, are similar to those of bagasse, "Onigaya" (*Miscanthus sinensis*) in Taiwan, and kanaff and the fiber length is similar to that of bagasse. Its length (0.5～1.5 mm long) is likewise rather too short to be used as pulp, without mixing with other wood pulp.

Chemische Bestandteile des Tees. I. Mitteilung.

Arginin aus Giokuro.*

(SS. 739～740)

Von Yaziro SAKATO.

(Aus d. Institut für Tee Kioto; Eingegangen am 4. 7. 1940.)

Neulich hat der Verfasser *Arginin* in Form von Pikrolonat (F. 231) in dem von Giokuro bereiteten Wasserextrakt festgestellt. Die Ausbeute an Pikrolonat aus 500 g Tee betrug 0.84 g.

* Giokuro ist eine der besten japanischen grünen Teesorten.

Chemische Untersuchung über die Bestandteile der Rosskastaniensamen. III. Mitteil.

(SS. 741～750)

Von M. KANDATSU.

(Agrikuturchem. Institut d. Univers. Tokyo; Eingegangen am 1. 7. 1940.)

Determination of the Total Vitamin B_1 in Natural Substances.

(pp. 751～754)

By Yosito SAKURAI and Tyoten INAGAKI.

(Research Laboratory of Meiji Sugar Co.; Received July 1, 1940.)

The authors used the mixture of takadiastase and "Sumeretin," a papain preparation, to convert the combined forms of vitamin B_1 into free state. The digestion period was over 24 hours at 37～40°C and pH 4～5.

Researches on Bamboo in Taiwan as a Raw Material for Pulp. Part IV.

On the Ashes and Some Characters of Pulps and "α-Celluloses" Obtained by Different Digesting Methods.

(pp. 755~760)

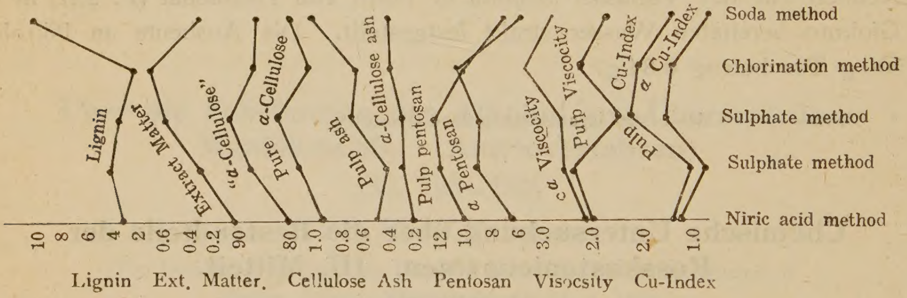
By Minoru TUTIYA and Masao IMAI.

(Industrial Research Institute of Taiwan; Received July 4, 1940.)

As a sample we used the stem, part of under branches, of 3 year old Keitiku. The methods used were as mentioned bellow, nitric acid method, caustic soda method, sulphate method, chlorination method and sulphite method (this composition is $Mg(HSO_3)_2$ and a little quantity of $MgSO_3$ in the state of solution).

The quantities and components of ashes were determined as shown in Table I and II.

The Fig. and Table III. represent the differences of quantities and values of pulps and "α-celluloses" which were obtained by each digesting method. The arrangement is made in the order of the quantities of α-cellulose ashes.



We may summarize the results as follows:—

1. Since 70% of ashes of Keitiku is composed of natrium and potasium, to obtain a little quantity of ashes the acid digesting method is better than the alkali.

2. Alkali method excudes more silica than the acid method.

3. The least quantity of ash is obtained by the nitric acid method which is the combined method of acid and alkali.

4. The pulps treated with 17.5% NaOH lower the quantities of pentosan and Cu-index, elevate the viscosity and diminish ashes to about half.

5. For the extinguishment of pentosan the alkali method is better than the acid one.

6. As the digesting methods for bamboo, each method has merits and defects, but among those the nitric acid method is the most recommendable and next is the sulphate method, in those adopted methods.

Table I.

Quantity of Ashes and Percentage of its Components.

Kind	Components (%)	Ash	SiO_2	Fe_2O_3	SO_3	P_2O_5	CaO	MgO	MnO	K_2O	Na_2O
Keitiku		1.77	12.20	4.86	1.70	1.62	1.78	0.97	1.94	12.70	56.30
Nitric acid Method	Unbleached pulp	0.53	43.78	10.35	9.56	—	6.92	3.62	2.50	13.38	3.02
	Bleached pulp	0.52	67.52	12.83	1.78	—	8.29	0.27	1.64	0.79	3.68
	α-Cellulose	0.21	50.92	29.57	4.92	—	1.64	—	1.60	1.64	5.33
Caustic soda Method	Unbleached pulp	1.29	13.81	17.23	7.95	—	8.45	4.52	9.08	4.54	31.86
	Bleached pulp	1.11	11.73	21.09	3.47	—	8.47	3.91	7.72	5.60	32.50
	α-Cellulose	0.42	14.27	24.09	3.89	—	17.74	3.91	3.72	8.29	22.65
Sulphate Method	Unbleached pulp	0.79	19.61	23.85	6.64	—	15.79	3.81	2.64	3.38	18.21
	Bleached pulp	0.43	13.57	20.71	11.10	—	27.38	7.57	2.50	6.10	2.90
	α-Cellulose	0.28	17.90	31.00	6.60	—	17.81	6.51	2.32	7.58	5.08
Chlorination Method	Unbleached pulp	0.73	35.44	16.95	0.25	—	1.72	1.23	3.39	40.58	2.47
	Bleached pulp	0.67	42.20	16.75	0.27	—	1.06	1.33	3.74	29.05	1.03
	α-Cellulose	0.41	52.28	3.71	0.14	—	1.28	2.45	6.72	27.20	0.86
Sulphite Method	Unbleached pulp	0.72	54.74	24.34	1.90	—	1.72	5.70	7.38	0.27	2.93
	Bleached pulp	0.71	59.26	18.78	1.64	—	1.67	6.73	5.99	1.47	3.13
	α-Cellulose	0.33	63.65	18.64	0.88	—	1.01	8.12	6.25	0.15	0.45

Table II.

mg of the Components to 100 mg of Bamboo and Percentage.

Kind	Components (%)	Ash	SiO_2	Fe_2O_3	SO_3	CaO	MgO	MnO	P_2O_5	K_2O	Na_2O

	Keitiku	mg	1770.00	215.94	86.02	30.09	31.50	17.16	34.33	28.67	224.79	996.51
		%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Nitric acid Method	Unbleached pulp	mg	191.00	118.16	22.90	18.25	14.50	3.11	4.77	—	25.54	5.75
		%	10.78	54.70	26.00	60.60	45.90	18.10	13.80	—	11.36	0.57
	Bleached pulp	mg	175.00	83.61	19.76	3.11	13.21	0.47	2.87	—	1.38	6.44
		%	9.80	38.71	22.90	10.30	41.80	2.70	8.30	—	6.13	0.64
	α-Cellulose	mg	57.00	50.92	16.85	2.80	0.93	—	0.93	—	0.93	3.03
		%	3.00	29.02	19.50	9.30	29.40	—	2.70	—	4.13	0.30
Caustic soda Method	Unbleached pulp	mg	377.00	51.09	63.75	29.41	31.26	16.72	33.59	—	16.79	121.88
		%	21.20	23.60	7.40	9.70	99.09	97.40	97.80	—	7.46	12.20
	Bleached pulp	mg	293.00	34.01	61.16	10.06	24.56	11.36	22.38	—	16.24	94.25
		%	16.50	15.70	7.41	3.34	77.80	66.10	65.10	—	7.22	9.40
	α-Cellulose	mg	98.00	1.39	2.36	0.38	1.73	0.38	0.36	—	0.81	2.21
		%	5.50	0.60	2.70	1.26	54.80	2.20	1.04	—	3.60	0.20
Sulphate Method	Unbleached pulp	mg	249.00	47.06	57.44	15.93	30.71	9.14	6.30	—	7.11	43.69
		%	14.00	21.70	66.70	52.90	97.30	53.20	18.30	—	3.16	4.38
	Bleached pulp	mg	116.00	14.91	22.78	21.21	30.11	8.32	2.75	—	6.70	3.19
		%	6.50	6.90	26.40	40.50	95.40	48.40	8.00	—	2.90	0.30
	α-Cellulose	mg	67.00	11.90	20.77	5.08	11.93	4.36	1.55	—	5.08	3.04
		%	3.70	5.50	24.10	16.80	37.80	25.40	4.50	—	2.20	0.30
Chlorination Method	Unbleached pulp	mg	330.00	116.95	45.57	0.82	5.67	4.05	11.18	—	133.91	8.15
		%	18.60	54.10	52.90	2.70	17.90	23.50	34.30	—	59.50	9.91
	Bleached pulp	mg	271.00	113.94	45.22	0.72	2.86	3.59	10.58	—	78.43	2.76
		%	15.20	52.80	52.50	2.30	9.06	20.90	30.80	—	34.80	0.20
	α-Cellulose	mg	145.00	75.80	12.62	0.20	1.85	3.55	9.44	—	39.44	1.24
		%	8.10	35.00	14.60	0.60	5.86	20.60	27.40	—	17.50	0.10
Sulphite Method	Unbleached pulp	mg	286.00	56.55	69.69	5.42	4.91	16.30	1.10	—	3.63	8.37
		%	16.10	72.40	81.00	18.00	15.50	94.90	61.40	—	16.10	0.80
	Bleached pulp	mg	241.00	142.81	45.25	3.95	4.02	16.21	14.43	—	3.54	7.54
		%	13.60	66.10	52.60	13.10	12.70	94.30	42.00	—	1.54	0.70
	α-Cellulose	mg	195.00	124.11	36.34	1.71	1.96	15.93	12.18	—	0.29	0.87
		%	11.80	57.40	42.20	5.60	5.20	92.80	35.40	—	1.70	0.80

TABLE III.

Components / Methods and kind		Ash (%)	Pentosan (%)	Cu-Index	Relative Viscosity	" α-Cellulose "	Unbleached pulp	
							Alcohol Benzol Ext. Matter (%)	Lignin (%)
Nitric acid Method	Blea. pulp	0.52	9.86	1.45	2.04	80.00	0.12	2.97
	α-Cellulose	0.21	6.28	1.39	2.14	*(73.72)		
Caustic soda Method	Blea. pulp	1.11	7.20	1.41	1.72	86.64	0.34	10.23
	α-Cellulose	0.43	5.78	0.70	2.84	(80.88)		
Sulphate Method	Blea. pulp	0.43	12.01	1.04	2.39	87.61	0.29	4.00
	α-Cellulose	0.28	9.43	0.75	2.53	(78.18)		
Chlorination Method	Blea. pulp	0.67	10.33	2.14	2.28	87.08	0.68	2.36
	α-Cellulose	0.41	10.62	1.49	3.34	(76.46)		
Sulphite Method	Blea. pulp	0.71	12.47	2.28	1.52	92.02	0.57	3.45
	α-Cellulose	0.33	9.38	1.54	2.64	(82.64)		
Mean	Blea. pulp	0.70	10.37	1.66	1.99	86.68	0.40	4.60
	α-Cellulose	0.33	8.29	1.17	2.69	(79.17)		

* N.B. α-Cellulose without Pentosan and ash.

Experimentelle Untersuchungen über die Wirkung von Radium und Röntgen-Strahlen auf die Gärungsmikroorganismen. (III. Mitteil.)

Über die Bedingung der Citronensäuregärung durch Asp. niger Radiumrasse III.

(SS. 761～771)

Von M. SIMO.

(The Institute of Research on Chemical Industry, Government-General of Taiwan, Japan; Eingegangen am 2. 6. 1940.)

Blätteralkohol. IV. Mitteil.(1)

Das *trans*- und *cis*-Problem bei Blätteralkohol, dem natürlichen Hexen-3-ol-1.

(SS. 772~780)

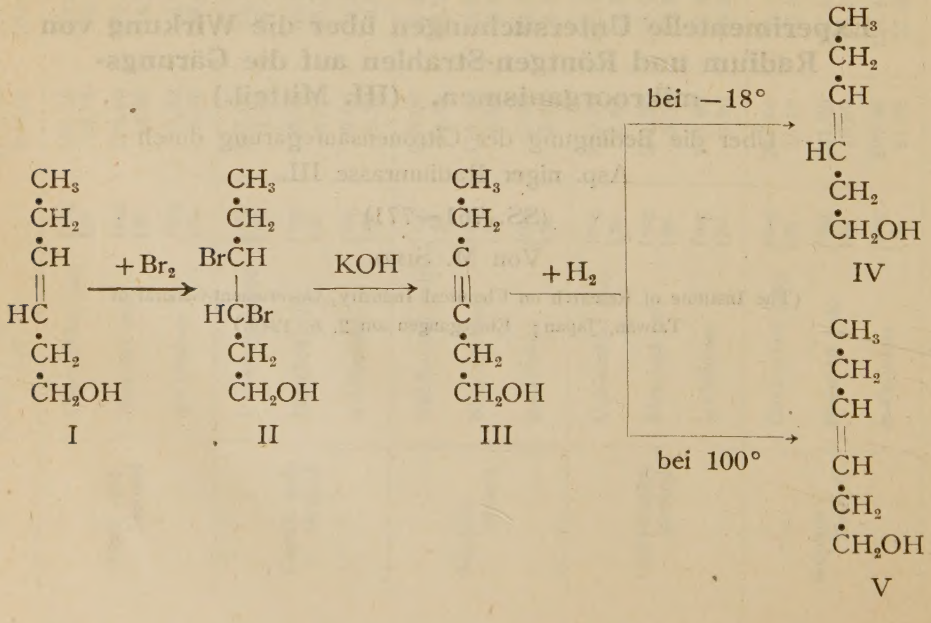
Von Sankiti TAKEI, Minoru ŌNO u. Kazuyosi SINOSAKI.

(Aus d. Agrikulturchem. Institut d. Universität Kyoto;
Eingegangen am 4. 7. 1940.)

In unseren früheren Mitteilungen(2)(3)(4) haben wir den in Pflanzenreich in freiem sowie gebundenem Zustand viel verbreitet vorkommenden Blätteralkohol, das β, γ-Hexenol, als *trans*-Hexen-3-ol-1 behandelt. Vor kurzem haben M. Stoll und A. Rouvé(5) vom Methyläthylketon ausgehend mittels eines recht mühesamen Vorgehens Hexin-3-ol-1 hergestellt; daraus haben sie durch katalytische Hydrierung mit Palladium-Kolloid bei 21~23° Hexen-3-ol-1 gewonnen. Sie haben einfach angenommen, daß das in dieser Weise synthetisch erhaltene Hexen-3-ol-1 *cis*-Form besitzt. Sie haben nun das 3,5-Dinitrobenzoat dieses *cis*-Hexenols dargestellt und beobachtet, daß der Ester nach wiederholter Umkristallisation bei 45~46°, das Gemisch von diesem Ester mit 3,5-Dinitrobenzoat des natürlichen β,γ-Hexenols (Schmp. 48.5°) bei 47~48° schmilzt. Hierauf haben sie die Identität des Blätteralkohols mit dem synthetischen sogenannten *cis*-Hexen-3-ol-1 festgestellt. Unserer Anschauung nach ist bei diesem Experiment und seiner Deutung den schweizer Forschern ein großer Irrtum unterlaufen, welchem sie bei der katalytischen Hydrierung des so vorsichtig hergestellten Hexinols leichtsinnig verfallen sind.

Hexin-3-ol-1 (III) aus Blätteralkohol (I)

Wir haben neulich auf folgendem Wege aus dem Blätteralkohol (I) eine gute Ausbeute Hexin-3-ol-1 (III) gewonnen.



Das so erhaltene Hexinol (III) läßt sich bei 66～67/13 mm abdestillieren und besitzt einen schwachen eigentümlichen Geruch. Das Allophanat des Hexinols schmilzt bei 187°, das 3,5-Dinitrobenzoat bei 72° sowie das Anthrachinon-β-carbonat bei 129°. Bei Oxydationsabbau mittels Kaliumpermanganat gab es in quantitativer Ausbeute Propionsäure, die als *p*-Jodphenacylester (Schmp. 97°) nachgewiesen wurde. Da wir glaubten, daß das Hexinol von Stoll mit unserem identisch sein müsse, haben wir nach seiner Vorschrift Hexin-3-ol-1 hergestellt und hieraus die obengenannten drei kristallinischen Derivate abgeleitet. Durch Mischprobe der entsprechenden Präparate aus den beiden Hexinolen konnten wir ihre Identität bestätigen.

	Schmelzpunkt des Hexinol-Derivats		
	aus Blätteralkohol	nach Stoll u. Rouvé	Gemisch
Allophanat	187°	187°	187°
3,5-Dinitrobenzoat	72°	71°	71°～72°
Anthrachinon-β-carbonat	129°	126°	126°～128°

Hexen-3-ol-1 (IV u. V) aus Hexin-3-ol-1 (III)

Bei der katalytischen Hydrierung einer dreifachen Bindung zur Doppelbindung sind die Tempraturbedigungen sehr wichtig. Wir haben zunächst Hexinol in Ätherlösung bei −18° und dann in Xylollösung bei 100° mittels Palladium-Bariumsulfat 1 Mol. Wasserstoff hydriert und die Reduktionsprodukte in kristallinische Derivate überführt. Die Schmelzpunkte der Derivate vergleichend, haben wir konstatiert, daß die bei der höhren Hydrierungstemperatur gewonnenen Hexenolderivate (V) bei einem niedrigeren Grade schmelzen als die entsprechenden der tieferen Temperatur erhaltenen (IV). Ferner wurde zugleich klar, daß die ersteren Schmelzpunkte mit denen der Derivate des synthetische aus Sorbinsäureester gewonnenen Hexenols übereinstimmen, die letzteren dagegen mit denen des Blätteralkohols.

	Schmelzpunkte der Derivate		
Hexen-3-ol-1 aus	Allophanat	3,5-Dinitrobenzoat	Anthrachinon β-carbonat
Hexinol bei −18° hydriert (IV)	146°	49°	68°
Blätteralkohol (I)	146°	49°	68° (2)
Hexinol bei 100° hydriert (V)	143°	28°	50°
Sorbinsäure-ester mit Natrium	143°	28°	50° (2)

Man kann hier nach bei 1 Mol. Wasserstoffanlagerung an dreifacher Bindung nur durch Änderung der Reaktionstemperatur nach Belieben zwei Raum-Isomeren gewinnen. In unserem Institut haben Herr Prof Y. Inoue und Herr H. Yukawa aus Stearolsäure durch 1 Mol. Hydrierung mit Platinschwarz bei −20° Elaidinsäure (*trans*-Form) und bei 100° Ölsäure (*cis*-Form) in guter Ausbeute hergestellt.

Wir dürfen auf Grund obiger Ergebnisse wohl zu recht annehmen, *daß in der Natur vorkommender Blätteralkohol, Hexen-3-ol-1, zur trans-Form gehört und er auch durch katalytische Hydrierung des Hexin-3-ol-1 bei tiefer Temperatur synthetisch* *gewonnen werden kann. Ebenso läßt sich das cis-Hexen-3-ol-1, das Raum-Isomer von Blätteralkohol, synthetisch aus Sorbinsäure-ester durch Reduktion mit Natrium sowie aus Hexin-3-ol-1 durch Hydrierung bei hoher Temperatur erhalten.* Wenn daher die 1 Mol. Hydrierung des Hexinols bei mitteler Temperatur durchgeführt wird, so muss man ein Gemisch von *cis*- und *trans*-Hexen-3-ol-1 gewinnen. Bei 50° haben wir das Hexinol mit Palladium-Bariumsulfat 1 Mol. Hydrierung untersucht und das Reaktionsprodukt in 3,5-Dinitrobenzoat überführt; dabei haben wir zuerst ein Kristallgemisch von dem Schmelzpunkte 38～42°, der nach wiederholtem Umlösen aus Äthanol bis auf 48° erhöht wurde, erhalten. Aus dem Filtrat des Kristallgemisches nach dem Eindampfen und der Eiskühlung schied sich wieder eine Kristallmasse ab, die nach Umkristallsierung aus Petroläther bei 28° schmilzt. Hierauf geht ganz klar hervor, daß Stoll und Mitarbeiter in ihere obengenannten Arbeit nur das höherschmelzende Kristallgemisch erfaßt haben und das Filtrat unberücksichtige gelassen haben.

Wie wir früher geschrieben haben, läßt der Geruch bei beiden raumisomeren Hexenolen einen deutlichen Unterschied bemerken, was man bei den aus dem entsprechenden kristallinischen Ester zurückgewonnenen Präparaten noch viel deutlicher erkennen kann. Unser reines synthetisches *trans*-Hexen-3-ol-1 (IV) riecht gerade wie der natürliche Blätteralkohol, also rein grünlich.(6)

(1) III. Mitteil.: J. Agr. Chem. Japan. **15**, 193 (1939); C. **1939**, 3705.

(2) I. Mitteil.: J. Agr. Chem. Japan. **14**, 709 (1938); C. **1938**, 3696.

(3) II. Mitteil.: J. Agr. Chem. Japan. **14**, 717 (1938); C. **1938**, 3696.

(4) S. Takei, T. Imaki u. Y. Tada: B. **68**, 953 (1935).

(5) Helv. **21**, 1542 (1938).

(6) In dieser Hinsicht haben sich die Schweizer wie folgt ausgedrückt: "L'odeur de notre hexénol, bien que très proche de celle du produit naturel, a tout de même une note nettement différente. Nous a attribouns ce fait à certaines impuretes qui influencent l'odeur de produit naturel aussi bien que celle du produit synthétique." (Helv. **21**, 1544 (1938).)

Studies on the Essential Oil of Formosan Black Tea.

(pp. 781～802)

By Ryo Yamamoto, Ken Ito, and Hassei Tin.

(Taihoku Imperial University; Received July 6, 1940.)

(Part IV.)

Continuing the previous experiments, we studied the neutral substances which existed in the distillate, the boiling point of the distillate being at 55～92°C (4 mm.) and not containing sulphurous compounds.

The substances were 71.8 g. in weight and were 41% of all the neutral substances, and also they were the most important substances for the flavour of black tea.

After separating the alcohols by the usual method (phthalic acid anhydride)

we examined the ingredients of the alchohols and found that almost all of them were aromatic primary alcohols, chiefly benzylalcohol and phenylethylalcohol. They were identified as 3,5-dinitrobenzoic acid ester, α-naphthylurethan and phenylurethan.

As was reported previously linalool exists in this distillate. Besides these alcohols, phenylpropylalcohol and unknown secondary turpen alcohol seem to exist.

In the same way, geraniol was separated from the distillate, of which the boiling point was at 95~112°C (4 mm) and this was identified as 3,5-dinitrobenzoic acid ester but citronellol was not identified in any way.

The neutral substances, excepting the alcohols, were separated by trimethylborate instead of metallic sodium. And 2-acetyl-pyrrol was separated from the distillate as nitrogenous compounds (Cf. the sixth report).

The distillate which does not contain nitrogenous and sulphurous compounds with the boiling point at 65~75°C (6 mm) seemed to be chiefly furan compound and had the characteristic flavour of black tea but it could not be identified as a pure substance.

(Part V.)

The sulphurous compounds which exist in the essential oil of black tea are classified roughly into the following three.

A. Gaseous compounds.
B. Compounds with middle boiling point.
C. Compounds with higher boiling point.

A. Gaseous compounds :—Gaseous compounds were produced in rich amount in the case of extracting essential oil by steam distillation. Very little quantity of methylmercaptan was detected which mixed with aldehydes of lower members and other gaseous compounds.

B. Sulphurous compounds with middle boiling point :—These compounds existed partially in each distillate in case the boiling point was not higher than 82°C (40 mm). But chiefly these were caught in the receiver cooled at the temperature of -60°C in the case of fractional distillation. In these distillates acid substance existed. This was produced as the result of natural decomposition after the distillation and seemed to be sulphonic acid. From the neutral part, the sulphonic acid being derived from it, sulphuric acid and methylsulphonic acid were obtained as oxidation products. The former seemed to be obtained from monomethylsulphide and the latter from dimethyl sulphide or methylmercaptan.

C. Sulphurous compounds with higher boiling point :—These compounds existed in the distillates in case the boiling point was 95~144°C (4 mm). Sulphonic acid and sulphuric acid were obtained as the result of natural decomposition. As the oxidation products from the neutral part, sulphuric acid and methylsulphonic acid were obtained. The original form of the decomposed substance was perhaps methylsulphonic acid ester. In both cases of (B) and (C) thiophenes did not exist. The sulphurous compounds described above were produced either from China tea or Assam tea and they are probably the common ingredient of tea leaves.

(Part VI.)

From the neutral part of the essential oil obtained from 1300 kg of Formosan black tea by steam distillation, 0.6 g of fine colourless needle crystals of nitrogenous compound was isolated in the distillate of 70∼78°C (3 mm).

It melted at 92°C exactly and was easily soluble in hot water and in almost all organic solvents. It especially showed a red pine wood reaction and sublimableness. Considering the usual analytical data it agrees most nearly to C_6H_7ON as the molecular formula.

Finally it was identified as 2-acetyl-pyrrol (methyl-α-pyrrylketon) comparing with the synthetic substance and furthermore pentabrom derivatives, derived from both were ascertained as the same substance.
